VIRGINIA Class NPES Subsystems
Unique Identification (UID)
Via
NPES Integration & Test Support System (NITSS)

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Agenda

- Background
- NITSS Overview
- NITSS – UID Delta
- Summary – Takeaway

Background

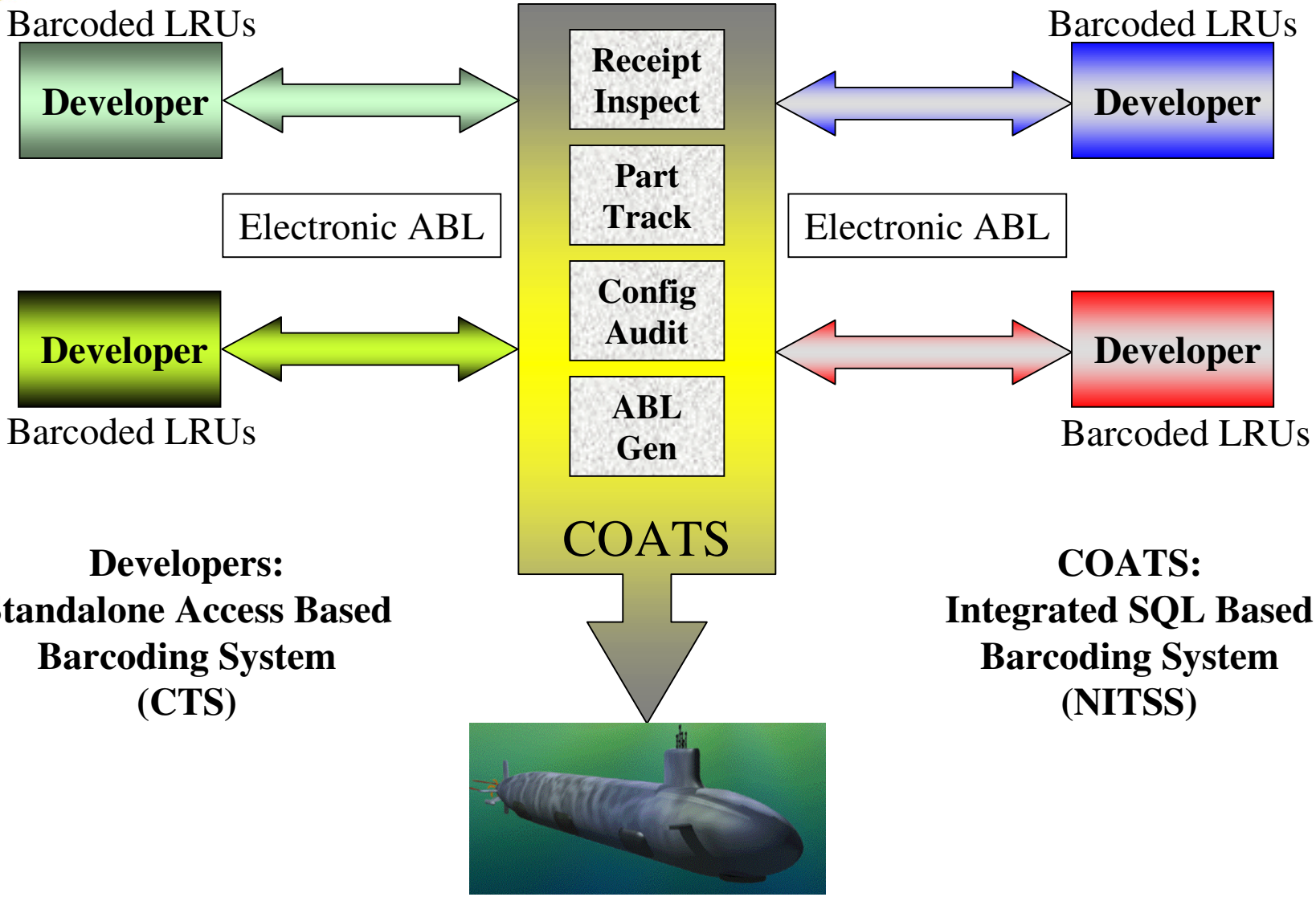
- VIRGINIA Class Employs Modular Construction With NPES Subsystems Delivered and Integrated at COATS
- Bar Coding Of VIRGINIA Class NPES Subsystems Was Implemented In 2000 Via NITSS To Manage Configurations and Track LRU Level Components at COATS
- Recent DoD Policies & Acquisition Regulations Require Unique Identification (UID) Using DoD Specified Formats That Differ From That Currently Employed By NITSS

NPES = Non-Propulsion Electronics Systems
NITSS = NPES Integration and Test Support System
COATS = Command and Control System Module Off-Hull Assembly and Test Site

Component Barcode Labeling Rationale

- Benefits Not Limited To ILS Activities
- Provide Significant Benefits To Integration and Test Efforts
  - Improves Error/Fault Isolation Capabilities
  - Improves Component Identification Capability
  - Improves Receipt/Inspection Capability
    - Electronic As Built List (ABL)
  - Improves Component Inventory and Tracking Capability
  - Improves Configuration Tracking Capability

Implementation For VIRGINIA Class



Developers:
Standalone Access Based Barcoding System (CTS)

COATS:
Integrated SQL Based Barcoding System (NITSS)

Improves Vendor's Ability To Recreate/Diagnose Problems Observed At COATS

NITSS Overview

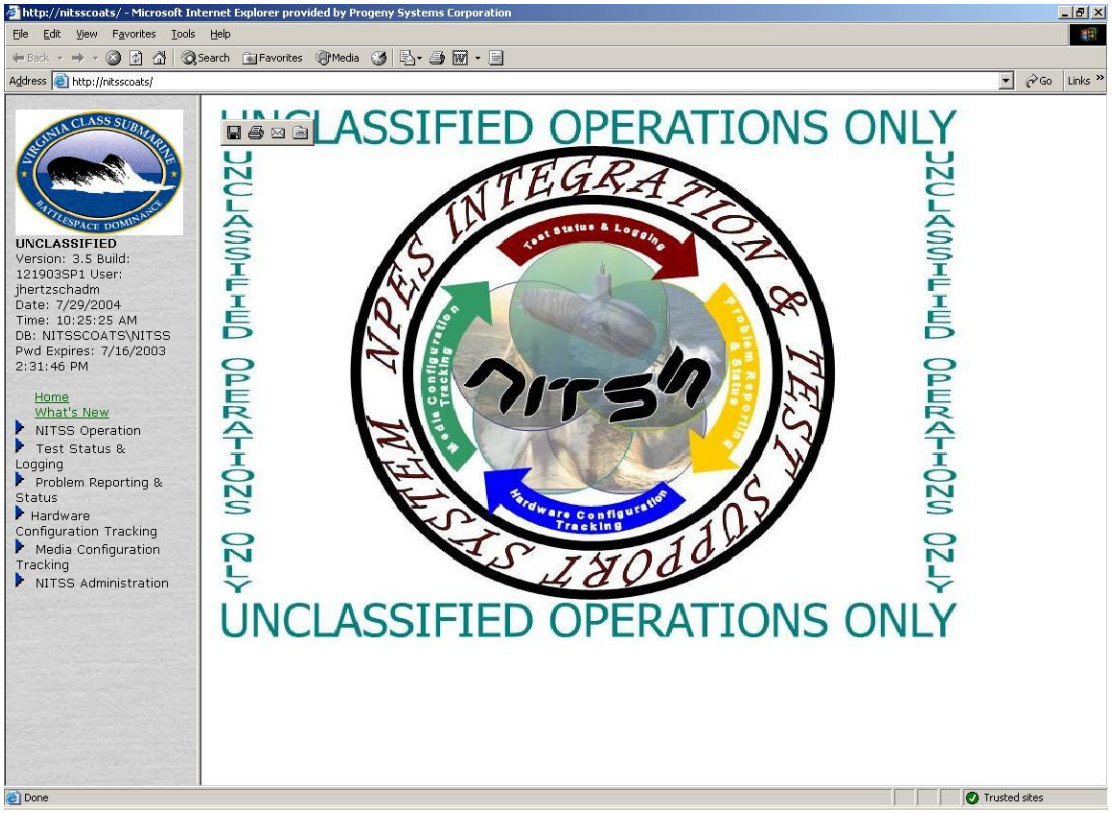
- NPES Integration and Test Support System (NITSS)
  - Developed Under PMS450 Phase II SBIR to Support NPES Integration and Test Activities
  - Operational at COATS (EB Shipyard) Since October 2000
  - Operational Onboard USS VIRGINIA (SSN 774) During Sea Trials
  - Currently Operational at Newport News Shipyard
- NITSS is a Web Browser-Based System That Provides
  - Component Tracking
  - Configuration Tracking
  - Software Installation Tracking
  - Test Logging
  - Test Run Status
  - Problem Tracking

Operational Environment

- Utilizes SQL Server Database Services For Data Storage
- SQL Is Configured To Replicate The Database Between Multiple Sites
- User Access To Data Is Through Internet Explorer Web Browser
- User Access To Data Depends On User ID
  - Privilege Levels Can Be Set Individually For Each NITSS Function And Subsystem Pair
    - Guest – View Data Only
    - Operator – View and Create Entries
    - Manager – View, Create, and Edit Entries

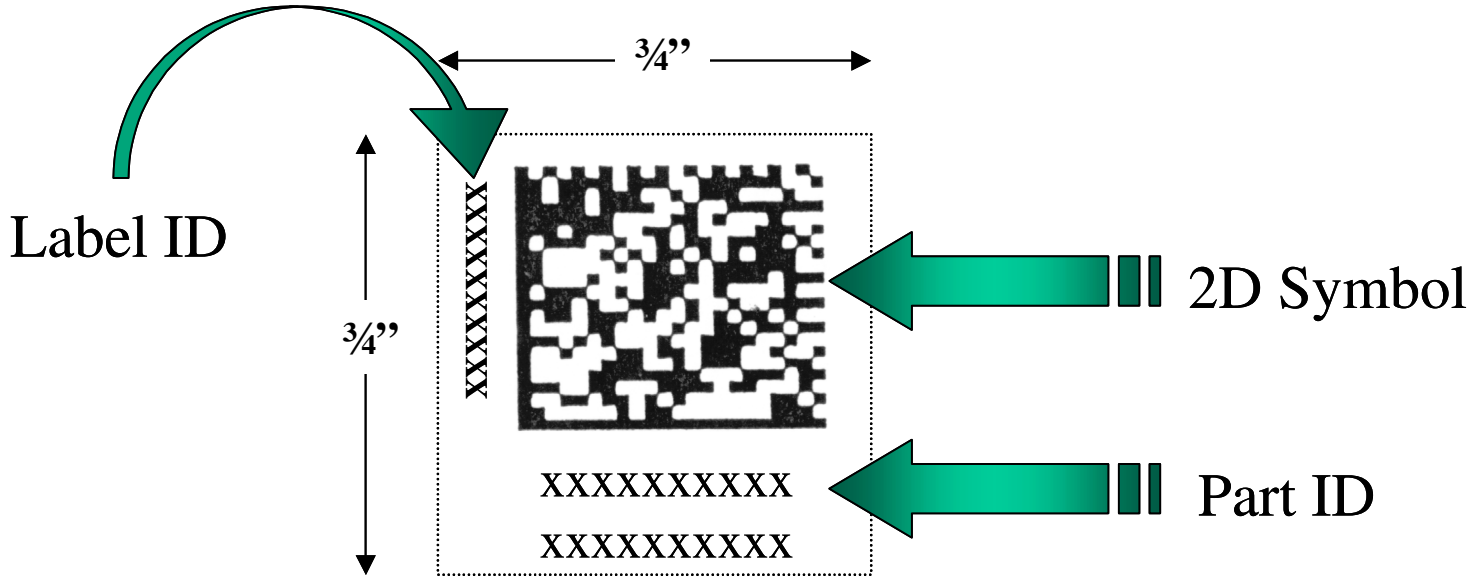
NITSS FUNCTIONALITY

- NITSS Functions
  - Test Status and Logging (TSL) Function
  - Problem Reporting and Status (PRS) Function
  - **Hardware Configuration Tracking (HCT) Function**
  - Media Configuration Tracking (MCT) Function
  - Common Data Services (CDS) Function



HCT Operations
Barcode Format

- NITSS Hardware Barcode Label Layout*



**Virginia Class Component Barcoding Requirements For NPES Subsystems, Dated 15 June 2001*

HCT Operations

2D Barcode Symbol Contents

- Data Fields Are Comma Delimited

Field	Title	Characters	Data Source	
1	OEM Part Number	45	OEM	**Mandatory Key Data Fields**
2	OEM Serial Number	30	OEM	
3	OEM Rev Level	5	OEM	
4	OEM Cage Code	5	OEM	
5	Part Nomenclature	25	OEM/Developer	
6	Provider Cage Code	5	Developer	
7	Part ID	20	Developer	**Printed On Label**
8	Part Rev Level	5	Developer	
9	SW Des	20	NITSS	**May not be imported**
10	SW ID	10	NITSS	
11	Label ID	11	Developer	**Printed On Label**
	Total	**191**		

NOTE: Character counts are maximums, actual count depends on data entered for each item

HCT Operations
Barcoding Operations

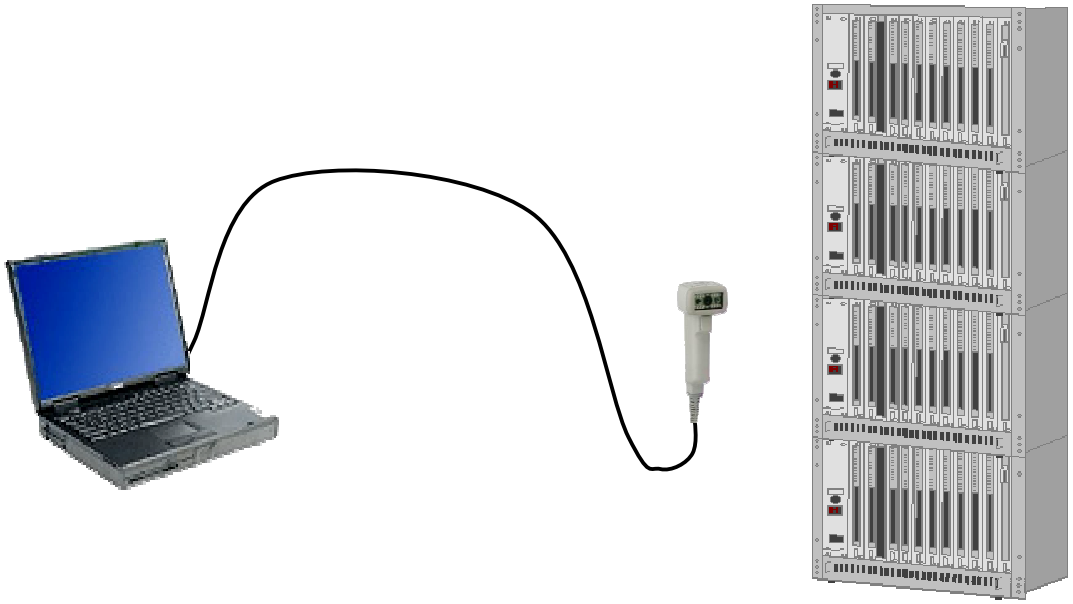
- Component Data Entered Into NITSS
  - File Import, Barcode Scan, or Keyboard Entry
- Barcode Labels & Component Listing Printed
- Barcode Labels Applied To Components

Data Entered → Label Printed → Listing Printed → Labels Applied

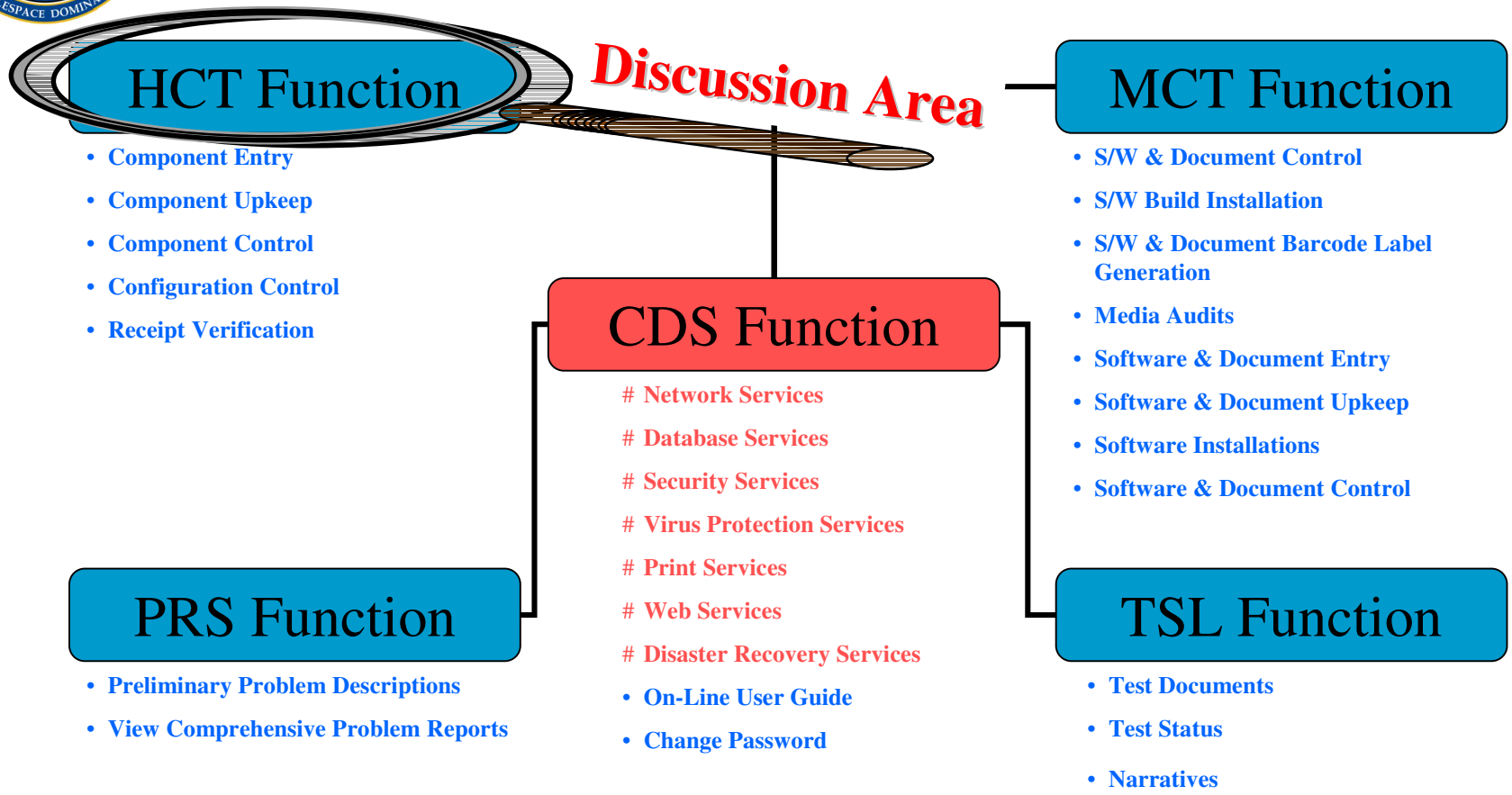
HCT Operations

Configuration Audit Operations

- System Configuration Entered Into NITSS
  - File Import Or Manual Entry
- Configuration Audit Performed
  - Full Or Partial System May Be Audited
- Configuration Baseline Established



NITSS Functional Relationships



• User Level Functionality #Admin Level Functionality

HCT Function

- Establish and Track Subsystem Hardware Components and Configurations
- Structured Around Utilization of Barcode Labeling of LRU (Lowest Replaceable Unit) Hardware Components
- Following Capabilities Provided:
  - Component Entry
  - Configuration Data Import
  - Hardware Location Tracking
  - Barcode Label Generation
  - Configuration Baseline Generation
  - Receipt Generation

MCT Function

- Establish and Track Software & Document Installation and Location
- Structured Around Utilization of Barcode Labeling of Software & Document Media
- Following Capabilities Provided:
  - S/W Build/Support Data Import
  - Software Install Tracking
  - S/W Media Barcode Label Generation
  - Document Build/Support Data Import
  - Document Media Barcode Label Generation
  - MCT Data Access
  - MCT Data Views

TSL Function

- Provides for Entry, Viewing, and Printing of Test Document Outlines, Test Narratives and Test Status
- Following Capabilities Provided:
  - Test Document Outline Entry
  - Test Status
  - Test Narratives
  - TSL Data Views
  - TSL Printing

PRS Function

- Preliminary Problem Description (PPD)
  - Provides for Generation, Viewing, Editing and Printing of NPES Related PPD Data
- Comprehensive Problem Reports (CPR)
  - Provides for Local Storage, Viewing, and Printing of NPES Related CPR Data
- Following Capabilities Provided:
  - PPD Data Export
  - CPR Data Import

CDS Function

- Provide Core Operating Services of NITSS
- Following Capabilities Provided:
  - Network Services
  - Database Services
  - Security Services
  - Virus Protection Services
  - Print Services
    - Utilizes Crystal Reports

HCT Operations

Hardware Configuration Tracking

- Utilizes 2 Dimensional (2D) DataMatrix Symbology Barcode Labeling of LRU Hardware Components
- OEM Part Number and OEM Serial Number Create Unique Identifier
  - Number Will Not Change Throughout Life of Component
  - Component Can Be Tracked Across All Hulls In NITSS
- Audits Conducted To Track Part Movement
  - Audit Of Physical Subsystem
  - Audit As Part Is Checked In Or Out Of Supply
- Complete Component History Available
  - History By Location, Part, Or Audit

NITSS – UID Deltas

UII Constructs

- There Are Two Methods To Construct The UII For An Item
  - Serialization within the Enterprise Identifier, called Construct #1, and
  - Serialization within the Original Part, Lot or Batch Number (within the enterprise identifier), called Construct #2.

	UII Construct #1	UII Construct #2
Based on current enterprise configurations	If items are serialized within the Enterprise	If items are serialized within Part Number
UII is derived by concatenating the data elements IN ORDER:	Issuing Agency Code* Enterprise ID Serial Number	Issuing Agency Code* Enterprise ID Original Part Number (or Lot Number or Batch Number) Serial Number
Data Identified on Assets Not Part of the UII (Separate Identifier)	Current Part Number	Current Part Number

*The Issuing Agency Code (IAC) represents the registration authority that issued the enterprise identifier (e.g., Dun and Bradstreet, EAN.UCC). The IAC can be derived from the data qualifier for the enterprise identifier and does not need to be marked on the item.

DoD UID Equivalents

- A Commercial Identifier Can Be Considered For Use As A DoD UID Equivalent If It Meets All Of These Criteria:
  - Must Contain an Enterprise Identifier,
  - Must Uniquely Identify an Individual Item Within an Enterprise Identifier, Product or Part Number, and
  - *Must Have an Existing Data Identifier (DI) or Application Identifier (AI) Listed in American National Standard (ANS) MH10.8.2, Data Identifier and Application Identifier Standard

Existing NITSS Barcode Does Not Meet This Criteria

Summary – Takeaway

- NITSS Provides Integration Testing Support To The VIRGINIA Program
  - Component And Configuration Tracking
    - Over 4 Years Of Successful Operations
    - Over 15,000 Components In The Database
  - Integrated With Electronic Logging and Centralized Trouble Reporting
- PMS450E Exploring Possibility Of Installing NITSS On All VIRGINIA Class Submarines
- NITSS Changes Required/Approach For Full UID Compliance Under Evaluation

NITSS Use Institutionalized Throughout VIRGINIA NPES Integration

Progeny Systems

Backup

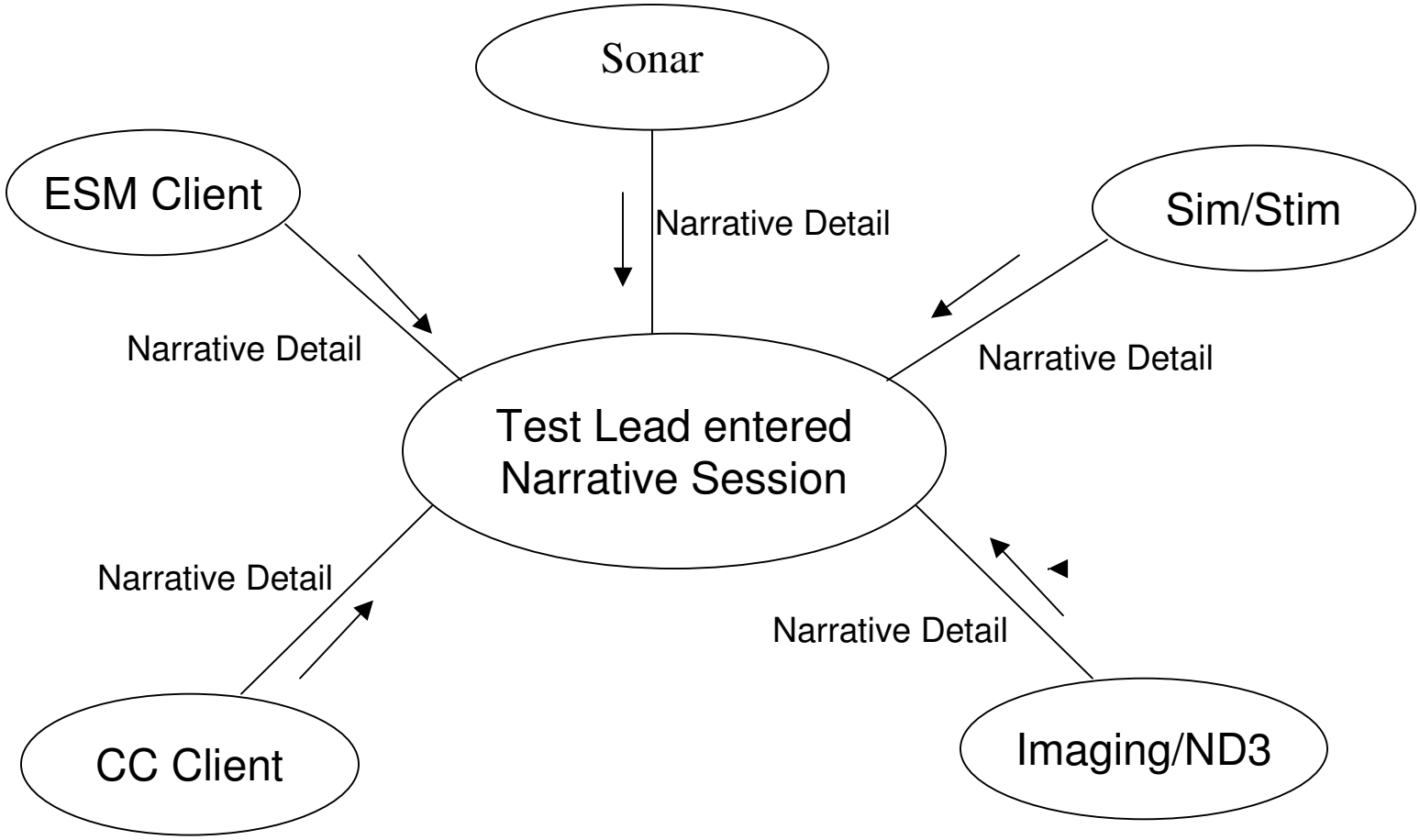
Additional NITSS Details

TSL Operations

Test Narratives

- Narrative Sessions
  - Used to document a test Evolution, Scenario, Procedure, or Issue
  - Multiple Clients (laptops) may enter data (Narrative Details) against a selected/designated Narrative Session
  - Accumulated Narrative Details provide a running log for the scenario for all watch stations (Sonar, CC, Imaging, etc….)

TSL Operations
Narrative Entry Concept



* Multiple clients add details to a selected session to generate a running log of test activity.

TSL Operations

Test Narratives Details

- Provides Capability for Test Conductors/Directors to enter Narratives Detail entries against selected Narrative Session
- When New Detail Entry button is selected
  - Narrative entry/edit page is displayed
  - Operator selects subsystem (ESM, CC Sonar) as appropriate
  - Enter narrative detail and SAVE

TSL Operations
Test Narratives

- Narratives
  - Each Narrative Automatically Tagged With Logged in User Id and Date/Time Stamp upon save.
  - Client side processing
  - Change log
    - Tracks all changes to saved narratives
      - All changes recorded by User ID, date/time and changed entries.

PRS Operations

Problem Reporting

- Preliminary Problem Description (PPD) Information used to document issues/problems observed.
- Comprehensive Problem Reports (CPR) provides for Local Storage, Viewing, and Printing of NPES Related CPR Data

PRS Operations

Preliminary Problem Descriptions

- PPD process
  - Client side processing
- Two (2) methods available to generate PPDs
  - New PPD from Preliminary Problem Description page.
    - Initialized with all entries cleared
  - New PPD button from Narrative Detail Page
    - Initialized with associated narrative entries filled in
- Each PPD Entry Automatically Assigned a PPD Number
- Change log
  - Added to track all changes to saved narratives/PPD
    - All changes recorded by User ID, date/time and changed entries

PRS Operations
CREATING PPD RELATIONSHIPs

- Linking PPD
  - Provides capability to link PPDs to
    - Narratives
    - CPRs
    - PPDs
  - Creating Relationship
    - Automatically when created from Narrative Detail
    - Manually through Edit function
    - Automatically through CPR Import
    - Automatically through Duplicate function

MCT Operations

Media Configuration Tracking

- S/W Configuration Tracking
  - S/W Build Information Entered Into NITSS
  - S/W Barcode Labels Generated
  - Tracks S/W Build Level installed to hardware components for configuration management
  - Tracks Location of S/W Media (e.g. CD, Tape, Floppy)
    - Audit storage location
    - Audit as media is checked in and out of supply
- Document Tracking
  - Documents Entered Into NITSS
  - Document Barcode Labels Generated
  - Tracks Location of Document Media (i.e. CD-ROM, Document)
    - Audit storage location
    - Audit as media is checked in and out of supply

MCT Operations
2D Barcode Symbol Contents

- Data Fields Are Comma Delimited

Field	Title	Characters	Data Source	
1	"SWMEDIA"	7	Fixed	Key Field (Printed On Label)
2	SW Media ID	10	NITSS	
3	Media Item Number	10	Developer	
4	Media Quantity	10	Developer	
5	Configuration ID	10	NITSS	
6	SW Build ID	10	Developer	Printed On Label
7	Media Type ID	10	NITSS	
8	Classification ID	10	Developer	
9	Class Tracking ID	32	NITSS	
10	Label ID	11	NITSS	Printed On Label
11	TBD	9	NITSS	
	Total	**129**		

NOTE: Character counts are maximums, actual count depends on data entered for each item